The San Pedro Creek Experience

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San Pedro Creek Wetland Ecosystem Restoration & Flood Control Project

- **Cooperating Partners**
  - **U.S. Army Corps of Engineers, South Pacific Division**
  - **City of Pacifica & Consultants**
    - **L.C. Lee & Associates, Inc.**
    - **Moffatt & Nichol Engineers**
    - **SAIC**
    - **Baker Engineering**
    - **Mendelian Construction**
    - **Power Engineering**

Linda Mar
CENTER
SAFEWAY
ROSS
SAFEWAY

San Pedro Creek Waters/Wetlands Riverine Ecosystem Restoration

- Rare tidally-influenced riverine waters/wetlands
- Ecosystem functions --
  1. Short and long term storage of flood flows
  2. Restoration of endangered species habitats
     - California Central Coast ESU steelhead (*Oncorhynchus mykiss*) stream
     - California Red Legged Frog (*Rana aurora draytonii)*

Central California Coast ESU Steelhead

(*Oncorhynchus mykiss*)

Male adult steelhead

Female adult steelhead

California Red-legged Frog
(*Rana aurora draytonii*)

Photograph courtesy of B. Schaffer, U.C. Davis

Four Essential Elements of the Hydrogeomorphic Functional Assessment

- Classification of waters/wetlands based upon hydrogeomorphic features
- Identification, definition & description of functions
- Development of reference system
- Development of an assessment model, associated protocols, and definition of functional indices

HYDROGEOMORPHIC CLASSES OF WETLANDS

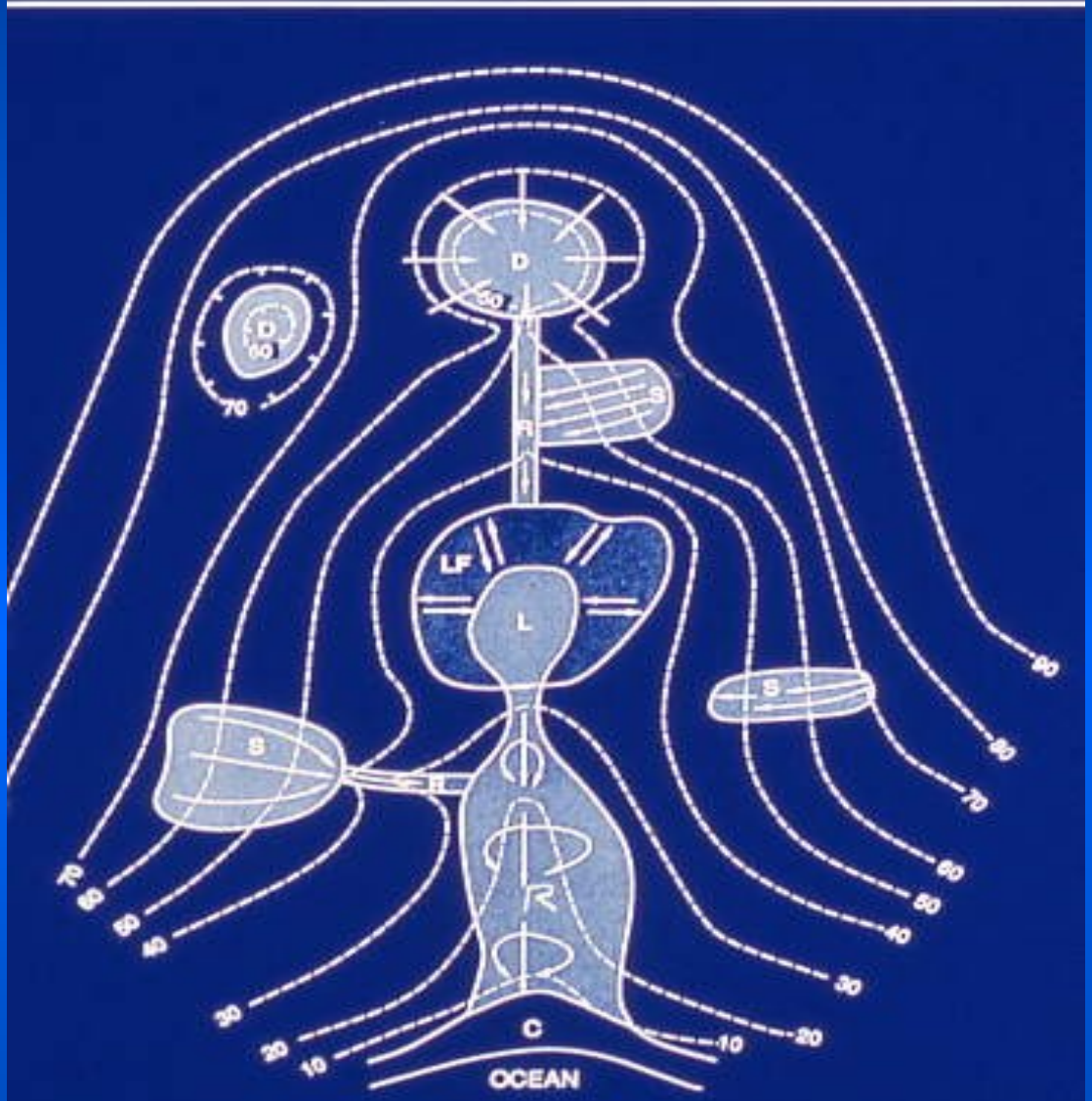
RIVERINE

FRINGE:
- Lacustrine
- Estuarine

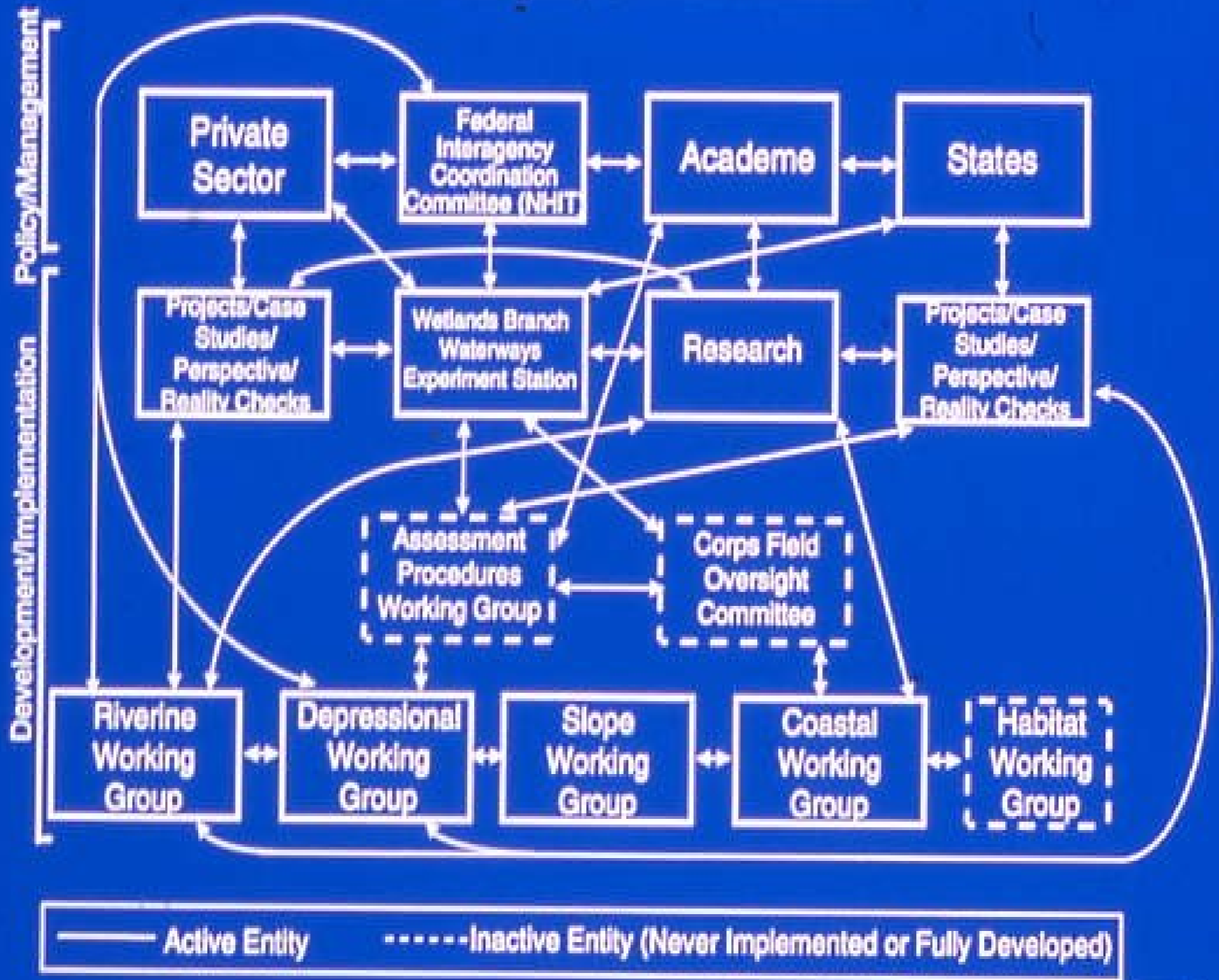
DEPRESSIONAL

SLOPE

FLATS:
- Mineral
- Organic



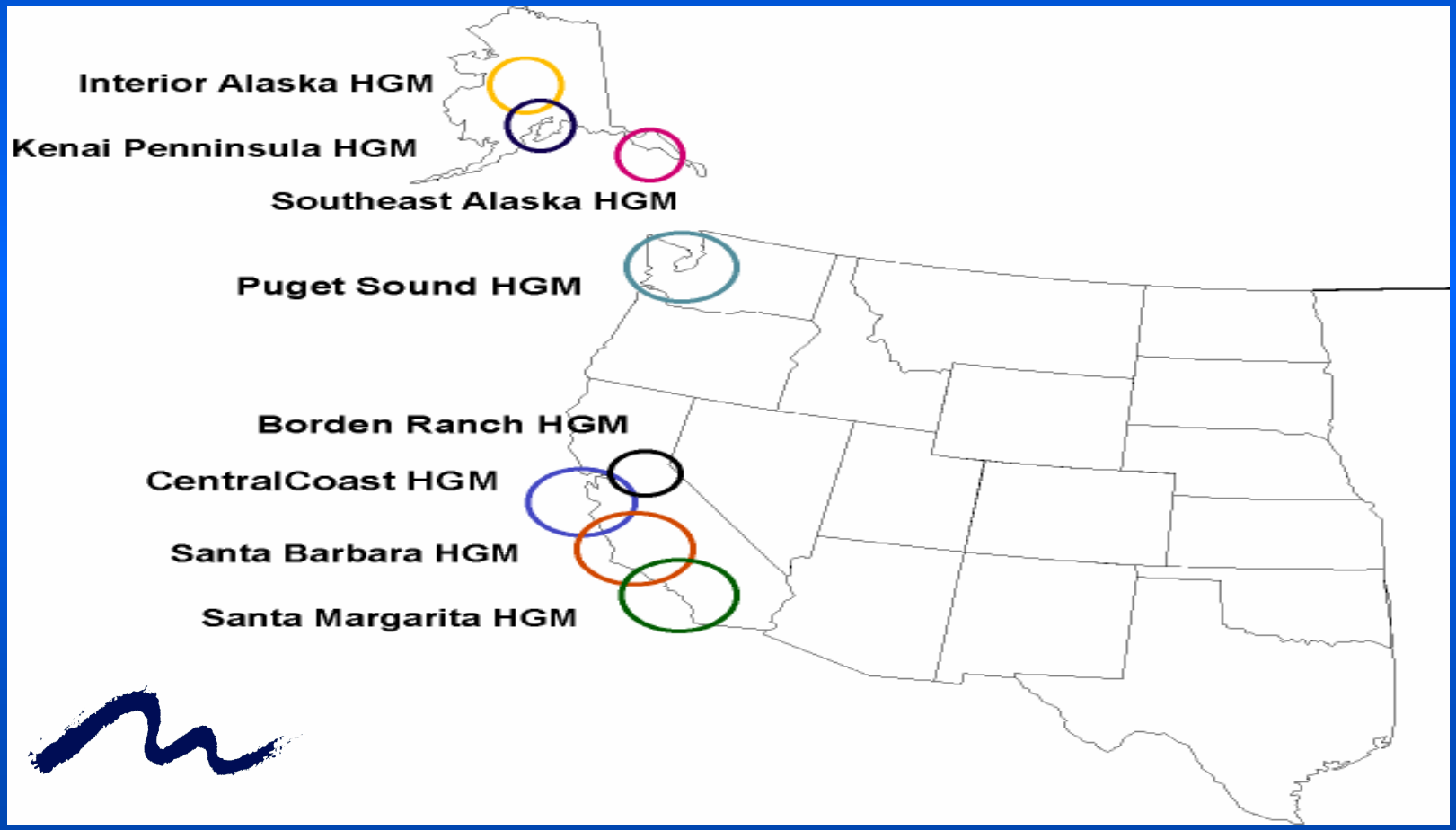
Hydrogeomorphic Wetland Types on a Landscape Level


Policy/Management
Development/Implementation
Private Sector
Federal Interagency Coordination Committee (NHIT)
Academe
States
Projects/Case Studies/ Perspective/ Reality Checks
Wetlands Branch Waterways Experiment Station
Research
Projects/Case Studies/ Perspective/ Reality Checks
Assessment Procedures Working Group
Corps Field Oversight Committee
Riverine Working Group
Depressional Working Group
Slope Working Group
Coastal Working Group
Habitat Working Group
Active Entity
Inactive Entity (Never Implemented or Fully Developed)

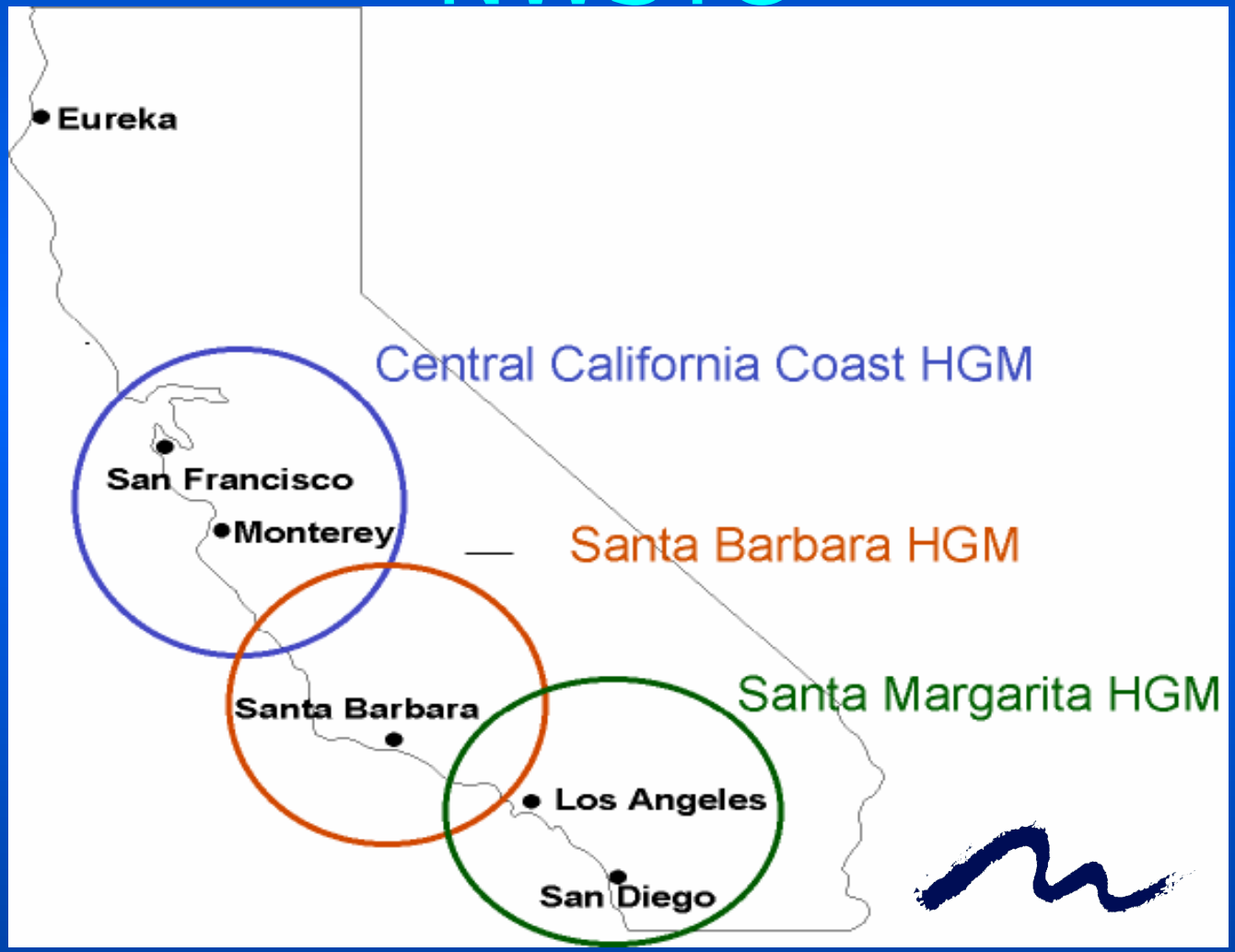
Use of Reference Wetlands

- Impact Assessment
- Design Template
- Monitoring/Contingency Triggering

West Coast HGM Projects Conducted by NWSTC



State of California Coastal HGM Projects Conducted by the NWSTC



Hydrogeomorphic Functional Assessment

- **Central Coast of California, from City of Pacifica to City of Santa Cruz**
- **3rd and 4th Order Streams (Strahler stream order 1:24,000)**
- **Low-gradient entry into the Pacific Ocean**
- **Funded by U.S. EPA, Region IX and the California Coastal Conservancy**

Application of HGM to California's Central Coast

- **56 sampling sites (1995), w/ 21 sites re-sampled (1996)**
- **Draft functional assessment model published in 1996**
- **Applied in design, permitting, development and implementation of compliance monitoring in six project to date**

Stream Ecosystem Restoration Projects in Central Coastal California Using HGM Guidebook (1995 – Present)

- **San Pedro Creek Wetland Ecosystem Restoration & Flood Control Project (1989 – present)**
- **Calera Creek Wetland & Riparian Ecosystem Restoration Project (1992 - present)**
- **Milagra Creek Riparian Restoration Project (1998)**
- **Pacifica Police Station Project (2000 – present)**
- **San Gregorio Creek Bank Stabilization & Riparian Restoration Project (1998)**
- **Calera Parkway Project (2000 – present)**

Stream Restoration Projects in Pacifica, California

- **San Pedro Creek Wetland Ecosystem Restoration and Flood Control Project**
- Calera Creek Wetland and Riparian Ecosystem Restoration
- Milagra Creek Riparian Restoration
- Pacifica Police Station

Engineering Design Criteria

- San Pedro Creek - 100 flood protection
- Calera Creek - Tertiary treatment & nutrient removal
- Milagra Creek - Bank stabilization through peak flow diversion
- Pacifica Police Station- Protection of endangered species habitat

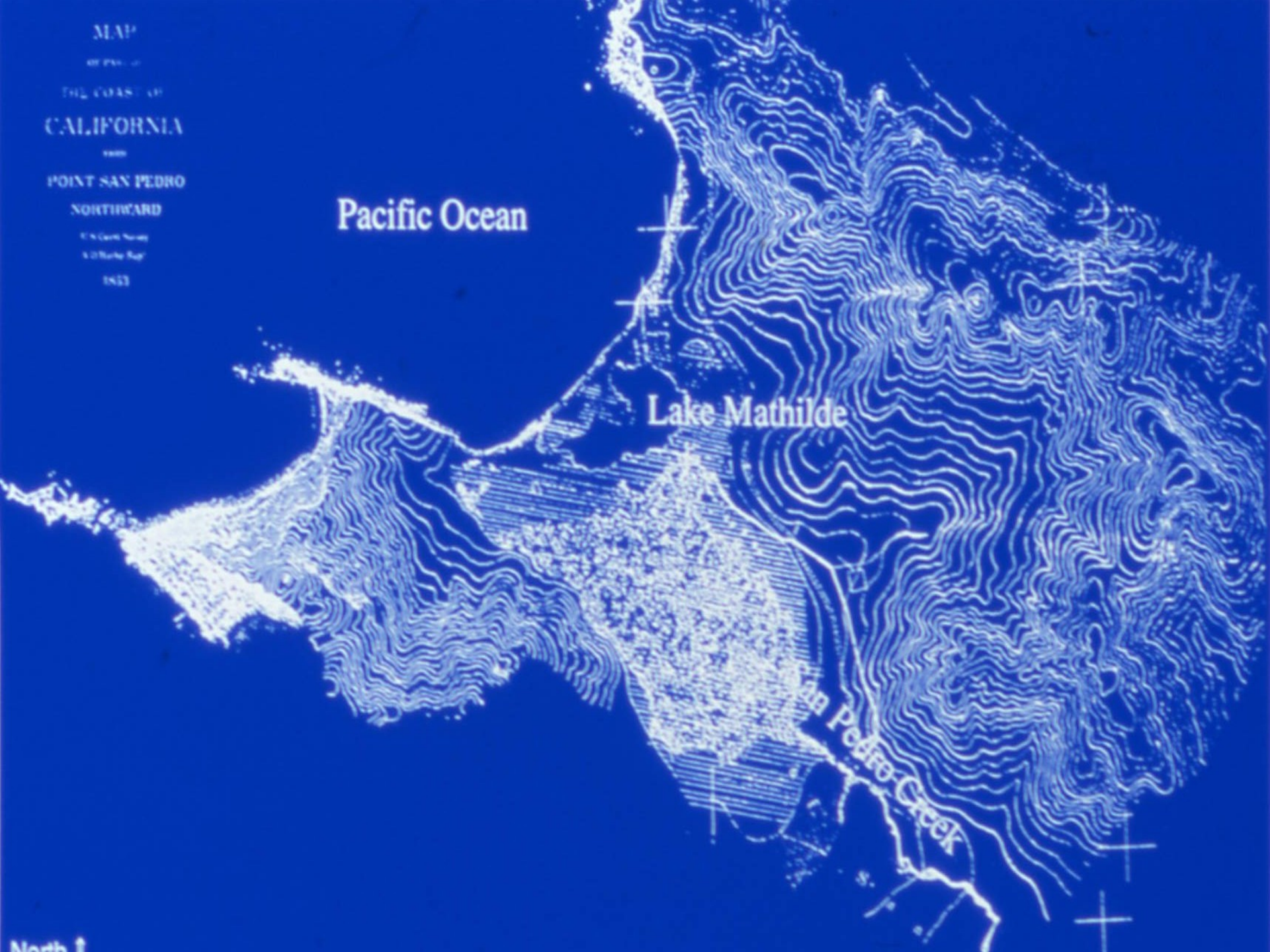
Chevron

San Pedro Creek Wetland Ecosystem Restoration and Flood Control Project

- **Initiated in 1974 – response to series of floods over four decades**
- **Joint U.S. Army Corps of Engineers & City of Pacifica Project**
- **Restoration Funded by Corps, state & federal grants, private foundation**
- **Current Status: Phase I Construction complete**

History of San Pedro Creek Flood Control Design

- **1976 - Rectangular Concrete Channel**
- **1984 - Rock-lined Trapezoidal Ditch**
- **1987 - Flood Wall & Earthen By-Pass Channel**
- **1990 - Restored Wetland Ecosystem**


MAP
CALIFORNIA
POINT SAN PEDRO
NORTHWARD
1853
Pacific Ocean
Lake Mathilde
La Pedro Creek
North

History of San Pedro Valley

- **8000 B.C. Human Settlement**
- **Ohlone Settlement**
- **Mission Outpost in 1700’s**
- **Late 1770’s Cattle Grazing**
- **1840’s Rancho San Pedro / Sanchez Family Land Grant**
- **1906 Agricultural Development**
- **1950’s Residential Development**
- **1975 Urban Development Largely Complete**

Restoration Objectives for San Pedro Creek

- **Flood control**
- **Increase of Functioning of the Wetland Ecosystems:**
  - **Hydrology**
  - **Biogeochemistry**
  - **Plant Community**
  - **Habitat / Faunal Support (endangered species habitat – steelhead and California red-legged frog)**

San Pedro Creek Riverine Wetland Ecosystem Restoration Design Team

- **City of Pacifica**
  - ***Scott Holmes***
- **Moffatt & Nichol Engineering**
- **L.C. Lee & Associates, Inc.**
  - ***Lyndon C. Lee***
  - ***Peggy L. Fiedler***
  - ***Cory Parker***

SUPER

Future Restoration Efforts in the San Pedro Creek Watershed

- Phase II: San Pedro Creek Wetland Ecosystem Restoration & Flood Control Project
- Restoration of Longitudinal Connectivity at Capistrano Bridge Crossing
- Integration of 103 (beach restoration) and 205 (flood control) projects

Figure 1a. Cross-section of Existing Conditions below Capistrano Bridge

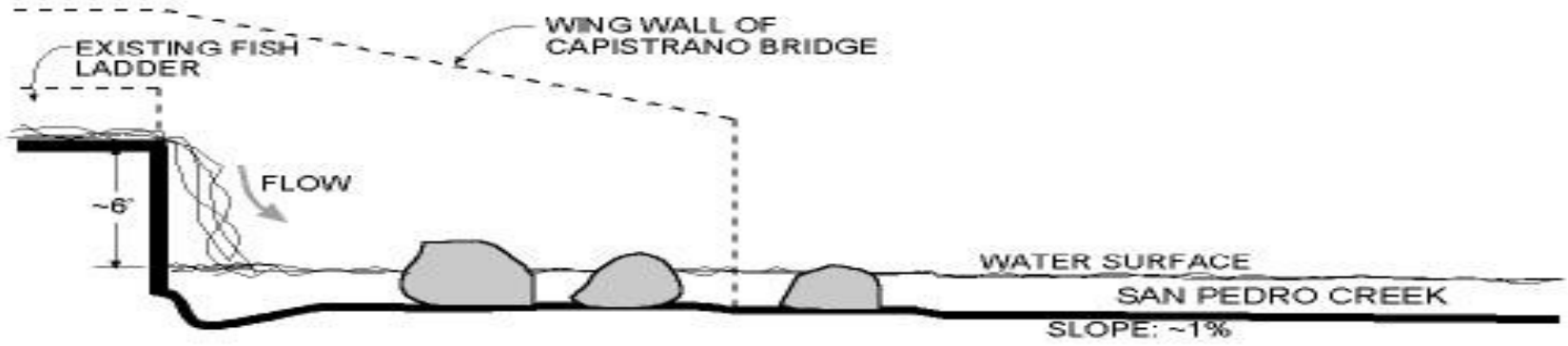


Figure 1b. Cross-section of Proposed Temporary Step-Pool Complex below Capistrano Bridge